

PROJECT MAKING THE GRADE

THE GOVERNOR'S **BLUE RIBBON PANEL** ON MATHEMATICS & SCIENCE EDUCATION



AN ACTION PLAN FOR RHODE ISLAND

Governor Carcieri's **Blue Ribbon Panel** on **Mathematics** and **Science** Education

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Daniel L. Smith, Raytheon, Co-chair

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First Lady

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Professor, Mathematics and Computer Science, Rhode Island College

Mr. David Bengston
VP/General Manager, RI, Amgen

Mr. Thomas Caffrey
Vice President for Global Technology, GTECH

Ms. Lisa Churchville
General Manager, NBC 10

Mr. Anthony DeAngelis
Principal, Vartan Gregorian Elementary School

Dr. L. Miguel Encarnação
President, IMEDIA

Ms. Valerie Forti
President, The Education Partnership

Dr. Arthur S. Gloster
Vice President for Information Systems, Bryant University

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Dr. Jack Warner
Commissioner of Higher Education, RI Board of Governors

Dr. Patricia Watkins
Superintendent, Central Falls School District

Ms. Vivian Weisman
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"The Governor's Commission on Mathematics and Science Education is responding to a national crisis in our education system. This crisis is the undeniable need to create our future scientists, engineers, and technically proficient leaders. With an executable, results-oriented plan, such as this Blue Ribbon Panel has recommended, we can create an educational environment that is equipped to challenge and engage teachers, students, and the business community in building the skills and competencies to ensure the success of Rhode Island in growing new and existing business in the state."

Daniel L. Smith, President, Raytheon Integrated Defense Systems; Co-Chair, Governor's Blue Ribbon Panel



MESSAGE FROM THE GOVERNOR

Dear Fellow Rhode Islander,

Rhode Island is the birthplace of the American Industrial Revolution. When Samuel Slater built his mill in 1793 on the banks of the Blackstone River in Pawtucket, he revolutionized the manufacturing of textiles and ushered in an era of unprecedented prosperity in Rhode Island.

Today, our state has the potential to once again become a center for engineering innovation and a model for economic growth. Our children are Rhode Island's most valuable resource. We can assure them a prosperous future through a conscientious investment, by both the public and private sectors, in improving their education.

Keeping pace with the dramatic growth and expansion of technological innovation is the key to prosperity in a rapidly evolving global economy. Educating our children, and future generations of Rhode Islanders, in the practical application of mathematics and science will be a critical factor in our ability to compete.

As former math and science teachers, the First Lady and I are committed to improving math and science education in Rhode Island. In my 2005 State of the State address, I announced the creation of a "Blue Ribbon Panel on Mathematics and Science Education" comprised of business leaders, educators, administrators and representatives of community organizations, thereby launching Project Making the Grade.

Dan Smith, President of Raytheon Integrated Defense Systems in Portsmouth, agreed to co-chair the Panel with me.

Dan and I charged the Panel with creating a plan for improving mathematics and science education in Rhode Island that encouraged educators and employers to work together to design practical yet powerful solutions.

This report is an action plan developed by the Blue Ribbon Panel on Mathematics and Science Education for the investment of human and material resources in Rhode Island toward the improvement of math and science education for our children. The Plan clearly identifies actions and measurable results. Join us in making this initiative a reality.

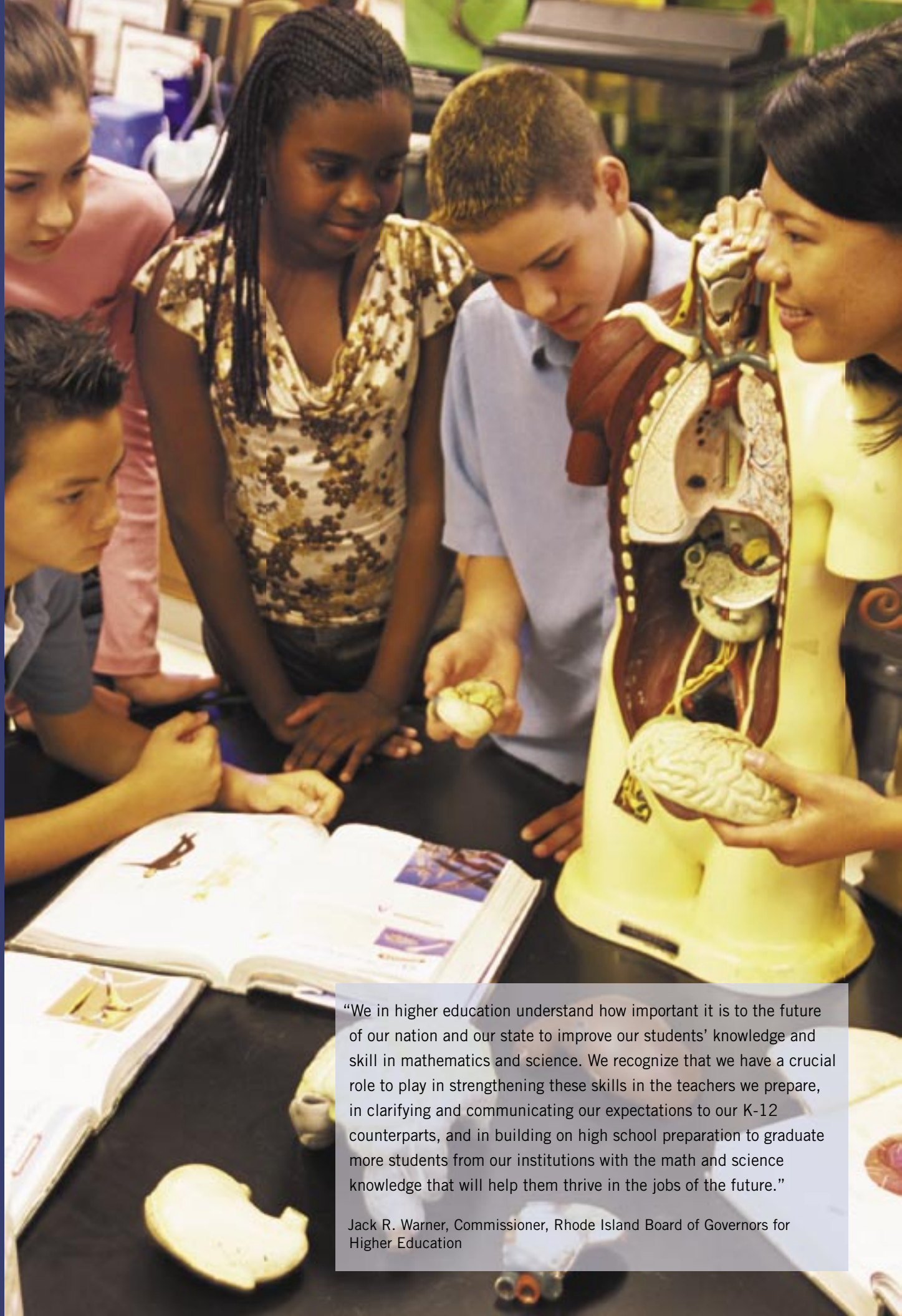
Sincerely,



The Honorable Donald L. Carcieri
Governor



Governor and First Lady meet with students.



“We in higher education understand how important it is to the future of our nation and our state to improve our students’ knowledge and skill in mathematics and science. We recognize that we have a crucial role to play in strengthening these skills in the teachers we prepare, in clarifying and communicating our expectations to our K-12 counterparts, and in building on high school preparation to graduate more students from our institutions with the math and science knowledge that will help them thrive in the jobs of the future.”

Jack R. Warner, Commissioner, Rhode Island Board of Governors for Higher Education

THE CHALLENGE

The last generation to pursue science, technology, engineering and mathematics (STEM) careers in significant numbers was the Baby Boom generation. They were inspired in part when the former Soviet Union launched Sputnik in 1957, and consequently, President John F. Kennedy challenged America to “put a man on the moon.” Our nation responded by educating significant numbers of young people to become scientists and engineers.

It was an exciting and inspiring time. The breakthroughs and inventions that resulted went well beyond the space program. But that generation is reaching retirement. While our country faces many significant challenges today, thus far, we have failed to inspire a new generation of young Americans to pursue excellence in science, technology, engineering and mathematics.

According to the National Science Foundation, half of America's scientists and engineers are forty years or older and the average age is steadily rising. In recent years, our educational system has not been successful in training enough new scientists, technicians, engineers or mathematicians.

Moreover, international and national studies show that students in the United States do not perform as well in math and science as students in many European and Asian countries. Students in Rhode Island also lag behind their peers in nearby New England states in math and science performance.

Rhode Island high school students must compete with students from around the world to be accepted by math and science programs at colleges and universities. Our high school and college graduates also must compete with those same students for jobs that require math and science skills.

High tech companies and other businesses in our state rely upon our educational system to produce graduates with basic math and science skills. Many local companies claim that they cannot hire enough Rhode Island graduates adequately educated in science, technology, engineering or mathematics to meet their manpower needs. As a result, Rhode Island employers are forced to

recruit workers from outside our state or from other countries.

The economic future of Rhode Island and the employment of our workforce depends upon the ability of our kindergarten, elementary, middle and high schools, as well as the institutions of higher learning who train our teachers, to improve the quality of math and science education in our state.

We simply must do a better job!

National Assessment of Educational Progress (NAEP)

Percentage of students tested who are at or above proficient standards.

SCIENCE • YEAR 2000 COMPARISON

	CT	ME	MA	NH	RI	National
4 th Grade	35%	38%	43%	Not participating	26%	27%
8 th Grade	35%	36%	42%	Not participating	29%	31%

MATH • YEAR 2003 COMPARISON

	CT	ME	MA	NH	RI	National
4 th Grade	41%	34%	41%	43%	28%	31%
8 th Grade	35%	29%	38%	35%	24%	27%

Source: NAEP 2000, 2003.

Highlights From the Trends in International Mathematics and Science Study (TIMSS)

In 1989, then-President Bush and the nation's Governors adopted six national education goals to be accomplished by the year 2000, one of which was to become "first in the world in science and mathematics achievement." Our 2003 results on TIMSS provide evidence that we still are lagging behind other countries, especially in mathematics.

"Overall, TIMSS offers sobering news to anyone who's concerned about education or the future of the country."

Ross Wiener, Policy Director,
The Education Trust

AVERAGE MATHEMATICS SCALE SCORES OF FOURTH-GRADE STUDENTS BY COUNTRY: 2003

Singapore	594
Hong Kong SAR	575
Japan	565
Chinese Taipei	564
Belgium-Flemish	551
Netherlands	540
Latvia	536
Lithuania	534
Russian Federation	532
England	531
Hungary	529
United States	518
Cyprus	510
Moldova, Republic of	504
Italy	503
Australia	499
International Average	495
New Zealand	493
Scotland	490

AVERAGE SCIENCE SCALE SCORES OF FOURTH-GRADE STUDENTS BY COUNTRY: 2003

Singapore	565
Chinese Taipei	551
Japan	543
Hong Kong SAR	542
England	540
United States	536
Latvia	532
Hungary	530
Russian Federation	526
Netherlands	525
Australia	521
New Zealand	520
Belgium-Flemish	518
Italy	516
Lithuania	512
Scotland	502
Moldova, Republic of	496
Slovenia	490
International Average	489

AVERAGE MATHEMATICS SCALE SCORES OF EIGHTH-GRADE STUDENTS BY COUNTRY: 2003

Singapore	605
Korea, Republic of	589
Hong Kong SAR	586
Chinese Taipei	585
Japan	570
Belgium-Flemish	537
Netherlands	536
Estonia	531
Hungary	529
Malaysia	508
Latvia	508
Russian Federation	508
Slovak Republic	508
Australia	505
United States	504
Lithuania	502
Sweden	499
Scotland	498
International Average	466

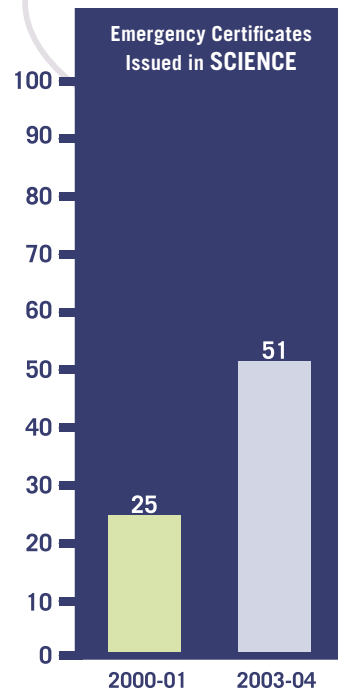
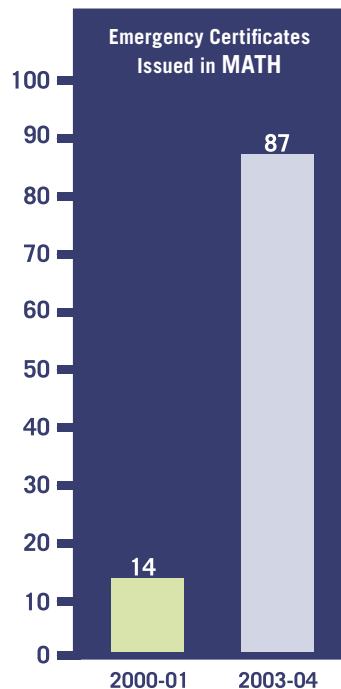
AVERAGE SCIENCE SCALE SCORES OF EIGHTH-GRADE STUDENTS BY COUNTRY: 2003

Singapore	578
Chinese Taipei	571
Korea, Republic of	558
Hong Kong SAR	556
Estonia	552
Japan	552
Hungary	543
Netherlands	536
United States	527
Australia	527
Sweden	524
Slovenia	520
New Zealand	520
Lithuania	519
Slovak Republic	517
Belgium-Flemish	516
Russian Federation	514
Latvia	512
International Average	473

Source: International Association for the Evaluation of Educational Achievement (IEA), Trends in International Mathematics and Science Study (TIMSS), 2003.

Rhode Island Faces A Growing Shortage Of Fully Trained Math And Science Teachers

These charts show the increase in the number of emergency certificates issued by the Rhode Island Department of Education (RIDE) for middle school and secondary math and science teachers for the years 2000-2001 and 2003-2004.*



Source:
RI Department
of Education,
2001, 2004.

Non-Traditional Teacher Preparation

In 2005, Rhode Island received a federal Teacher Quality Enhancement Partnership Grant from the U.S. Department of Education for Project RITER (RI Teacher Education Renewal). This program will streamline the process by which, for example, an engineer or research scientist may become a certified teacher.

Progress is Being Made

Results of state mathematics assessments conducted by the R.I. Department of Elementary and Secondary Education showed a marked improvement in mathematics achievement from 1998 to 2004 in our elementary, middle and high schools. But we must accelerate our efforts and achieve even greater success to enable our students to be competitive with those in other states and around the world.

Percent of Students Who Met the State Standards in Math			
	1998	2004	% change
Elementary	30	51	+21%
Middle	32	39	+7%
High	35	44	+9%

Source: RI Department of Education, 1998, 2004.

*Note: Teachers who apply for emergency certificates in science or math are usually certified in some branch of science (biology, chemistry, physics, or general science) and have completed some coursework in the area for which they have applied for the temporary emergency certificate. These teachers are required to enroll in courses necessary for becoming fully certified in the area for which they have applied.

ENGAGING STAKEHOLDERS

Central to the work of the Governor's Blue Ribbon Panel and Project Making the Grade was a multi-stakeholder engagement strategy that sought input from all those who affect or are affected by Rhode Island's education system.

Discrete dialog sessions were conducted with four key stakeholder groups: the higher education community, teachers and administrators from kindergarten through high school, business and industry leaders and high school students. Additional sessions were conducted with mixed groups of educators, administrators, business leaders, community leaders and parents. All were asked to share experiences, perceptions and perspectives to reach a common understanding of the issues and to develop well-considered recommendations for change.

Each session elicited frank discussion about what is working and what is not in math and science education in Rhode Island. Approximately 50 post secondary educators, 50 K-12 teachers, 35 parents, 40 business leaders and 80 students participated in the process.

Concurrently, the project team conducted an extensive review of student performance data and ongoing improvement initiatives affecting math and science education. Both the dialog sessions and the research revealed that some existing initiatives have laid the foundation for improving Rhode Island's results, but much more still is needed to address the challenge.

The stakeholder engagement process created an opportunity for consensus building and strengthened our capacity to turn ideas into action. To succeed, a collective commitment is needed.

A Few Rhode Island Innovations

1. KITES and GEMS-NET

KITES (Kits in Teaching Elementary Science) is a project managed by a partnership between Rhode Island College and the East Bay Educational Collaborative. It provides elementary and middle school teachers with top-notch standards-based curriculum materials, a system of delivery and replenishment of science kits, an ongoing program of professional development, a way to assess the program and its effectiveness with students, and a program to build community and administrative support. Operating from the University of Rhode Island, Guiding Education in Math and Science Network (GEMS-NET) supports South County elementary and middle school teachers with science programs, lesson plans and curricula. www.ebecri.org/www.gemsnet.gso.uri.edu

2. PRIME TIME

Higher education faculty members from the arts and sciences and education departments of Rhode Island colleges and universities partner with elementary and secondary educators to improve the quality of mathematics and science teaching in schools with an initial focus at the middle school level. www.ridoe.net

3. RI Scholars

The RI Scholars Program, an initiative of The Education Partnership, integrates business and education with its emphasis on creating a meaningful high school diploma and a college and workforce ready population that is well-versed in science, mathematics and technology. Business leaders encourage students in four districts – Providence, Portsmouth, West Warwick, Westerly - to take a rigorous set of high school courses that exceed the newly designed high school graduation requirements. www.edpartnership.org

4. The JASON Project

JASON Expeditions is a unique, hands-on science and mathematics education program founded in 1989 by Dr. Robert Ballard (Professor of Oceanography at URI), discoverer of the RMS Titanic. Each year a team of JASON scientists and student argonauts travel to a different part of the world and broadcast the excitement of their expedition back to downlink sites around the globe, including our upper elementary and middle schools. In Rhode Island, JASON Expeditions are coordinated by the Office of Marine Programs at the University of Rhode Island. www.jasonproject.org

DIALOGUE SESSION

RECURRING THEMES

1. Our high school graduates are not adequately prepared in math and science when they enter a college or university.
2. Current expectations of high school graduates are too low.
3. Our students do not understand how to “apply” math and science and have difficulty with “analytical thinking.”
4. More emphasis needs to be placed on teaching problem-solving skills.
5. Our society needs to do a better job of conveying why math and science are important and relevant to other learning and to the careers of the future.
6. All stakeholders want standardized, rigorous, statewide curricula in math and science.
7. Too many good initiatives come and go. This initiative needs to address the issue of sustainability.
8. More cooperation, coordination, and alignment are required across the education system - Pre-K through 16 – so that there is a more integrated approach to education, particularly in math and science.
9. Equitable resources should be invested in high-performing students as well as under-performing students to meet No Child Left Behind regulations. Rhode Island needs to raise the performance of all students rather than just equalizing performance at lower than proficient levels.
10. Teacher contracts pose some unique challenges to math and science education improvements.
11. More money should be allocated to and spent on math and science education.
12. Many schools need more, better, and newer science and technology equipment.
13. Existing teacher preparation program curricula must be improved to produce well-qualified math and science teachers.

CREATING THE VISION

Building on the momentum of the dialog sessions, a statewide rally provided all stakeholders with the opportunity to further inform the recommendations of the Governor's Blue Ribbon Panel.

In the rally's keynote address, Dr. Ioannis Miaoulis, President and Director of the Boston Museum of Science, set the stage for action and provided a rich context for the need to change. His observations clarified why our state's math and science education improvement action plan must be set in a broader framework that includes technology and engineering and emphasizes how important science, technology, engineering and mathematics (STEM) are to everyday life and future employment. The practical application of mathematics and science must become an integral part of the mathematics and science curriculum that is taught in Rhode Island to our students.

The Action Plan of the Governor's Blue Ribbon Panel on Math and Science Education that follows is a direct result of the active participation and feedback received from students, parents, teachers, administrators, professors, and business and community leaders across the Ocean State. Through Project Making the Grade, four major issues emerged with specific strategies and performance measures for addressing the challenge before us:

Governance and Culture:

Accountability for results in mathematics and science has been assigned to the Governor's new Statewide PK-16 Council. Through this structure, responsibility for and commitment to action will be shared among our state's educational and business leaders to ensure system improvement on each of the recommended strategies.

Teacher Recruitment:

Rhode Island administrators are concerned about the number of mathematics and science teachers that are retiring, or nearing retirement, and the scarcity of new candidates to fill those positions. The rise in the number of emergency certificates issued by the Rhode Island Department of Education for secondary math and science teachers reflects this reality. Creative strategies are needed to both encourage and retain quality teachers in these subjects.



"Educators should focus on helping students to understand how the things that people actually use *work*."

Ioannis Miaoulis, President and Director of the Boston Museum of Science



Teacher Quality:

Rhode Island needs teachers who can design and carry out innovative, student-centered instructional approaches in STEM subjects that are directed toward high achievement and who bring a spirit of inquiry to classroom practice. They must be comfortable with using technology and teaming with people in their own school buildings and profession, as well as with a variety of people in business, at universities, and in the community. As such, change is needed in our teacher preparation programs and more opportunities for professional development must be provided, in particular for our elementary school teachers.

Improved Learning Opportunities for Students:

To empower students in mathematics and science, we must reform not only our curriculum, teaching methods, and delivery systems to emphasize inquiry-based, hands-on teaching and learning. We also must change our collective expectations, beliefs and values about the importance of STEM subjects and the ability of all our students to perform at a high level of achievement in these subjects.

Our state has reached a time of decision. We are firmly resolved to move – step by step – from where we are to where we need to be to meet the challenge and improve our results in mathematics and science. Working together, our students, our schools, and our state will make the grade!

PK-16 Council

One of the key “champions” identified in the Project Making the Grade Action Plan is the PK-16 Council. On April 25, 2005, Governor Carcieri issued Executive Order 05-08 creating the Statewide PK – 16 (pre-kindergarten through college) Council. The Council, chaired by the Governor, is responsible for ensuring improved student achievement at all levels through more formalized and systemic communication and alignment between Rhode Island’s elementary, secondary, and post secondary education systems and workforce development programs. It is charged with supporting the recommendations of the Governor’s Blue Ribbon Panel on Math and Science and will track our state’s progress over time. Membership includes the:

- Chair of the Board of Governors for Higher Education
- Chair of the Board of Regents for Elementary and Secondary Education
- Commissioner of Higher Education
- Commissioner of Elementary and Secondary Education
- Director of the Department of Labor and Training
- Executive Director of the Rhode Island Economic Development Corporation
- Chair of the Rhode Island Economic Policy Council
- Chair of the Human Resources Investment Council

ACTION PLAN

Issue: Governance & Culture

Goal: Coordinate and sustain reforms in science, technology, engineering and mathematics (STEM) education across K-12 and higher education systems with employer involvement.



Strategy 1. Charge the PK-16 Council with driving STEM education reform to ensure implementation, sustainability, and success of this initiative.

Actions for consideration:

- A. Appoint a project manager to coordinate implementation of the recommendations and ensure accountability.
- B. Set performance targets on new student assessments as they are implemented.

Performance Measures:

1. PK-16 Council adopts Blue Ribbon Panel's recommendations in fall of 2005.
2. PK-16 Council approves implementation and tracking strategies by spring of 2006 and reviews progress at six-month intervals.
3. All performance measures are met by specified target dates.



Strategy 2. Develop and execute a STEM education communication strategy and campaign to broaden public support for and recognition of the importance of STEM subjects to our state's future economic vitality.

Actions for consideration:

- A. Develop a core set of messages.
- B. Conduct quarterly reviews and issue annual progress reports.
- C. Sponsor events to publicize and recognize teacher/student achievements.
- D. Establish a clearinghouse/web site to publicize STEM education improvement initiatives.

Performance Measures:

1. PK-16 Council adopts a STEM education communications strategy with implementation plan and budget by spring of 2006.
2. A STEM education improvement web site and clearinghouse is launched by fall of 2006.
3. Key stakeholders recognize improved performance in STEM subjects as a public policy priority by 2007.



Co-Chairs Dan Smith (L) and Governor Carcieri lead a discussion at the statewide rally.




Strategy 3. Develop statewide protocols to create community partnerships among business, non-profit organizations, community groups, schools, and colleges and universities in support of math and science education, including after school programs.

Performance Measures:

1. Protocols are developed and adopted by fall of 2006.
2. An increasing number of partnerships meeting the new protocols become actively engaged in STEM education improvement so that there are at least 10 such partnerships by 2007, 20 by 2008, and 30 by 2010.

Issue: Teacher Recruitment

Goal: Attract more individuals to teach STEM subjects in which teacher shortages exist.



Strategy 4. Develop and fund a system of financial incentives including scholarships, education loan forgiveness programs, hiring bonuses and pay scale differentials for pre- and in-service STEM educators.

Actions for consideration:


- A. Require more extensive, precise and integrated data tracking to include the number of Rhode Island STEM teachers (certified, alternatively certified, emergency certified) and job placement trends of RI teacher prep program graduates with degrees in STEM.
- B. Establish improvement targets for the increasing number of new graduates from Rhode Island teacher prep programs employed in RI as STEM teachers.

Performance Measures:

1. The requirement for emergency certified math teachers decreases at least 10% per year from 87 (2003-04 baseline), requiring that a minimum of 9 traditionally or alternatively certified math teachers are brought into the system each year as needed.
2. The requirement for emergency certified science teachers decreases 10% per year from 51 (2003-04 baseline) requiring that a minimum of 5 traditionally or alternatively certified science teachers are brought into the system each year as needed.

“Our students, if they are to lead productive lives in the global economy, must be comfortable with mathematics, science, and technology from an early age, and they must be proficient in those core subjects when they graduate from high school. Project Making the Grade provides the focus for an aggressive agenda that the Board of Regents supports enthusiastically.”

Peter McWalters, Commissioner of Elementary and Secondary Education



Strategy 5. Facilitate and increase selective use of non-certified professionals (e.g., university professors, retired engineers, etc.) to partner with classroom teachers in STEM subjects.

Performance Measures:

1. Regulations for increasing the selective use of non-certified professionals to partner with classroom teachers in STEM subjects are developed and adopted by 2007.
2. A minimum of 25% of Rhode Island school districts engage non-certified professionals to support teaching STEM subjects beginning in 2008.



Strategy 6. Increase the number of STEM teachers by improving the alternative certification process.

Actions for consideration:


- A. Seed the development of summer course offerings on pedagogy.
- B. Develop recommendations and adopt a more effective alternative certification process based on best practices of other states.

Performance Measures:

- 1. Recommendations are developed during 2006 and adopted early in 2007.
- 2. Summer course offerings in pedagogy for professionals seeking alternative certification as STEM subject teachers are available by 2006.
- 3. A minimum of 10 professionals become alternatively certified to teach math courses and 10 to teach science courses in 2007. In each subsequent year an additional 5 professionals in math and 5 in science are alternatively certified.

Issue: Teacher Quality

Goal: Improve mathematics and science teacher prep programs, especially for elementary school teachers.

 **Strategy 7.** Develop and implement a more rigorous teacher prep program that emphasizes a strong conceptual understanding and application of knowledge and skills for all Mathematics and Science teachers (K-12), but in particular for our elementary school teachers.

Actions for consideration:

- A. Strengthen requirements in math and science for certification of elementary school teachers.
- B. Set more rigorous certification requirements that would include attaining a state-established cut-score on PRAXIS II Content Knowledge exams for middle and high school teachers.

Performance Measures:


1. RI teacher prep programs begin tracking secondary PRAXIS II Content Knowledge scores by 2006.
2. Math and science requirements for certification as an elementary school teacher in Rhode Island are strengthened by 2007.
3. RI teacher certification requirements include attaining a cut-score on PRAXIS II Content Knowledge exams for middle and high school teachers by 2008.

Goal: Provide relevant, quality, professional development for all mathematics and science teachers, including elementary school teachers.

 **Strategy 8.** Develop a network of industry leaders and STEM professionals who will serve as mentors for mathematics and science teachers and work with local employers to increase school/industry partnerships.

Performance Measures:

1. A network of at least 35 industry leaders and STEM professionals is established in 2006 and grows by at least 25 members each year until the network is sustained at 250 – 260 members.
2. The number of Rhode Island mathematics and science subject teachers completing relevant externships increases annually against a 2005 baseline of 11 math and science teachers so that at least 50 teachers complete externships in 2008, and 100 in 2010.

 **Strategy 9.** Require an annual prescribed amount of professional development for all math and science teachers, including our elementary school teachers.

Action for consideration:

- A. Reallocate Article 31 dollars to incrementally increase the amount of funds targeted to mathematics and science professional development (currently, 2% of Article 31 funds professional development in math, 0% in science, and 5% in technology).

Performance Measures:

1. A minimum of 25% of all teachers complete approved math/science content-specific professional development each year.
2. 100% of in-service teachers have an I-plan (Individualized Professional Development Plan).

Issue: Learning Opportunities

Goal: Provide opportunities for all students to engage in rigorous STEM education.

 **Strategy 10.** Develop and implement statewide mathematics and science curricula that align with Grade Span and Grade Level Expectations, and that integrate engineering and technology standards and a “hands-on/minds-on” instructional approach in accordance with identified, commonly accepted best practices.

Actions for consideration:

- A. Require tracking of student course-taking data.
- B. Set improvement targets for the number of students taking Algebra II and for the number of students completing STEM subject majors at RI post secondary schools.

Performance Measures:

- 1. Statewide curriculum in math is adopted in August 2006; legislation is passed to create statewide curriculum in science in spring of 2006 and science curriculum is adopted in 2008.
- 2. The percentage of RI 4th graders scoring at or above proficiency on NAEP math tests increases from 28% to at least 50% by the year 2015.
- 3. The percentage of RI 8th graders scoring at or above proficiency on NAEP math tests increases from 24% to at least 50% by the year 2015.
- 4. The percentage of 11th graders scoring at or above proficiency on the state’s math assessment (NSRE) increases from 44% to at least 55% proficient by 2007.
- 5. RI’s mean SAT math score increases annually against a baseline of 505 so that the mean score is at least 535 in 2008 and at least 565 in 2010.
- 6. The number of students scoring at college-level mastery on STEM subject AP exams increases annually from a baseline of 442 to at least 508 in 2008 and at least 584 in 2010.
- 7. The percentage of CCRI students requiring developmental math decreases annually from the 54% of students currently requiring such remediation, to 40% in 2008 and 25% in 2010.

 **Strategy 11.** Establish statewide standards and a system that includes sufficient staffing to maintain up-to-date science and technology equipment in K-12 schools and institutions of higher education.

Performance Measures:

- 1. A statewide standard and process for equipment and technology modernization is adopted by 2007, and all schools have updated science and technology equipment by 2010.
- 2. All schools and institutions of higher education report sufficient staffing of technology management personnel by 2008.
- 3. All schools and institutions of higher education develop and begin implementing plans for continuous technology training for teachers and professors by 2008.
- 4. The ratio of students to computers improves from 4.9:1 to 2:1 by 2010.



Strategy 12. Develop a series of best practice guidelines that includes teacher training on the use of technology to increase both in-school and after-school access to innovative computer based programs and opportunities for course sharing between schools.

Performance Measures

1. Guidelines are developed and adopted by 2007.
2. All mathematics and science teachers are integrating technology into instruction at least 50% of the time by 2010.



Governor Carcieri's **Mathematics** and **Science** Education Project Team

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Because of its success in building public/private sector partnerships and strategic inclusion of business, education and government communities, Tech Collective was selected to coordinate Project Making the Grade.



Tech Collective is a formal alliance of independent but affiliated technology industry associations, which today includes InfoGroup and BioGroup. Its mission is to drive technology growth and innovation in Rhode Island by building strong and supportive business communities, providing workforce development resources and offering entrepreneurial support to companies, agencies, organizations, individuals and students. Membership in the Tech Collective affiliate groups is open to companies, educational institutions, other not-for-profit and non-profit organizations, government agencies, individuals and students who develop, produce, sell, distribute and/or utilize technologies or provide technology services.

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